DETAILED ACTION

Response to Amendment

1. In response to the Final Office Action mailed 12/21/07, applicant has submitted an amendment and Request for Continued Examination filed 3/21/08.

Claims 1-3, 5, and 9, have been amended. Claims 4 and 6-8 have been cancelled. New Claim 10 has been added.

Response to Arguments

2. Applicant's arguments with respect to claims 1-3, 5, and 9, have been considered but are moot in view of the new ground(s) of rejection.

Applicant refers to col. 31, lines 43-49 of Gao to argue that Gao teaches the use of linear predictive analysis to determine the transmission rate (Amendment filed 10/3/07, page 7).

While this section does describe LPC analysis, this portion is not necessarily related to the transmission rate determination (i.e., full-rate, half-rate, etc.) since the LPC Analysis module receives "the pre-processed speech signal" but the description afterwards does not describe where this is used to determine which of full-rate, half-rate, etc. Gao teaches a characterization section which uses characterization information to determine rate using a rate selection module (col. 35, lines 24-35). This section operates on "the pre-processed speech signal", which is the same speech signal that is input to the LPC analysis in applicant's cited portion of Gao, and therefore is a signal that is not yet subjected

to LPC analysis. The portions of Gao that follow and that describe voice activity detection, signal characterization, and rate selection (col. 35-39) do not describe the explicit and required use of any LPC parameters in their analyses.

The VAD description does mention the 10th order autocorrelation coefficients provided by the LPC analysis module being used in the voice activity detection, but this one element in a list of potential parameters that can be used in voice activity detection parameters ("voice activity based on monitoring a plurality of parameters, such as", col. 35, line 59 - col. 36, line 8).

Therefore, Gao does not require the use of LPC analysis in voice activity detection, and by extension, characterization and rate selection either.

Since applicant's claim language recites "without using at least one of a linear prediction analysis", Gao still teaches this limitation.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-3, 5, and 9, are rejected under 35 U.S.C. 103(a) as being unpatentable over Gao (US 6,574,593), in view of Gupta et al. (US 5,459,814), hereafter Gupta.

As per Claim 1, Gao teaches an apparatus for determining a transmission rate, the apparatus comprising:

a speech/silence classifying portion, which classifies an input frame as speech or silence, ("determine if the pre-processed speech signal 308 is some form of speech or if it is merely silence or background noise", column 35, lines49-51) based on a threshold value that is predetermined ("using a set of predetermined threshold values", column 35, line 56) for each of a fixed code-book gain value, a minimum value of an adaptive code-book gain value, a noise to signal rate, and a difference between a maximum value and a minimum value of a pitch delay that correspond to an input parameter of a coded bit stream ("uses the parameters of the pitch lag and the adaptive codebook gain from recent frames", column 35, lines 66-67; "monitoring a plurality of parameters, such as", col. 35, line 46 – col. 36, line 8; "Noise-to-Signal Rate… category of analysis… background noise… voice activity decision", col. 37, line 64 - col. 38, line 36; "fixed-codebook gains with a plurality of fixed codebook energies", col. 21, lines 50-55; where Gao's teaching of assorted parameters used in voice activity renders obvious the use of any other parameters in Gao's disclosure that can be used to determine a voice activity decision, and Gao teaches that fixed codebook gains can represent energies, and energy is commonly used for voice activity decisions);

a voiced/unvoiced classifying portion, which classifies as voiced/onset or unvoiced an input frame that is classified as speech by the speech/silence classifying portion ("detection of an unvoiced noise-like speech frame", column

36, line 20; "categories of analysis... voice activity... unvoiced... 6-clas...4-class", col. 35, lines 35-45; "following the voice activity determination", col. 36, lines 10-16), based on a threshold value that is predetermined for the minimum value of the adaptive code-book gain value ("based on the pre-processed speech signal 308", column 36, lines 21-22, where the pre-processed speech signal contains adaptive codebook gain values, see column 36, lines 2-3, and it is obvious to use the minimum value to ensure that no false alarms or rejections occur);

a voiced/onset classifying portion, which classifies as voiced or onset an input frame that is classified as voiced/onset by the voiced/unvoiced classifying portion, based on a class of a previous frame ("determines whether a frame with a characterization as a voiced frame should characterized as class 4—'Non-Stationary Voiced', or class 5—'Stationary Voiced'", column 42, lines 24-27);

a stationary/non-stationary classifying portion, which classifies as stationary or non-stationary an input frame that is classified as voiced by the voiced/onset classifying portion ("determines whether a frame with a characterization as a voiced frame should characterized as class 4—'Non-Stationary Voiced', or class 5—'Stationary Voiced'", column 42, lines 24-27), based on a threshold value that is predetermined for the amount of change in the ACBG value or a threshold value of the difference between the maximum value and the minimum value of the pitch delay ("characterization module 328 performs characterization using, for example, the pre-processed speech signal 308", column 37, lines 19-20, where the pre-processed speech signal contains adaptive codebook gain values and pitch lags, see column 36, lines 2-3; "uses

the parameters of the pitch lag and the adaptive codebook gain from recent frames", column 35, lines 66-67); and

a transmission rate determining portion, which determines a transmission rate and a type of the determined transmission rate for an input frame, based on transmission rates and types of the transmission rates that are predetermined for a class of the input frame corresponding to the result of said classification of the input frame as speech or silence, as voiced or unvoiced, as voiced or onset, and as stationary or non-stationary, wherein the transmission rate is determined without using at least one of a linear prediction analysis and an open-loop pitch detector ("rate selection is based on the characterization of the frame of the speech signal", column 10, lines 9-10, and "the final characterization class may also be used by the type classification module", column 42, lines 44,45; col. 35, lines 24-35; "voice activity based on monitoring a plurality of parameters, such as", col. 35, line 59 - col. 36, line 8; See Response to Arguments).

Gao fails to teach where the threshold value that is determined for the minimum value of the ACBG is a new threshold value, and where the threshold value of the difference between the maximum value and the minimum value of the pitch delay is a new threshold value.

Gupta suggests where the threshold value that is determined for the minimum value of the ACBG is a new threshold value, and where the threshold value of the difference between the maximum value and the minimum value of the pitch delay is a new threshold value ("VAD", col. 1, lines 28-37; "thresholds

updated", col. 5, line 65 – col. 6, line 10; where Gupta generally teaches updating thresholds in voice activity detection).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Gao to include the teaching of Gupta of where the threshold value that is determined for the minimum value of the ACBG is a new threshold value, and where the threshold value of the difference between the maximum value and the minimum value of the pitch delay is a new threshold value, in order to adapt to different operating environments, as described by Gupta (col. 5, line 65 – col. 6, line 10).

As per Claims 2 and 9, their limitations are similar to those in Claim 1, and so are rejected under similar rationale.

As per Claims 3 and 5, Gao fails to teach wherein the new threshold value that is determined for the minimum value of the ACBG in step (b) is set to be greater than the threshold value that is predetermined for the minimum value of the ACBG in step (a), and wherein the new threshold value of the difference between the maximum value and the minimum value of the pitch delay in step (d) is set to be smaller than the threshold value of the difference between the maximum value and the minimum value of the pitch delay in step (a).

Gupta suggests wherein the new threshold value that is determined for the minimum value of the ACBG in step (b) is set to be greater than the threshold value that is predetermined for the minimum value of the ACBG in step (a), and

wherein the new threshold value of the difference between the maximum value and the minimum value of the pitch delay in step (d) is set to be smaller than the threshold value of the difference between the maximum value and the minimum value of the pitch delay in step (a) ("VAD", col. 1, lines 28-37; "thresholds updated", col. 5, line 65 – col. 6, line 10; where Gupta generally teaches updating thresholds in voice activity detection, and logically one of ordinary skill in the art would not want to only increase/decrease the value of the threshold since the necessary threshold may need to be decreased/increased, respectively, based on the change in environment).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Gao to include the teaching of Gupta of wherein the new threshold value that is determined for the minimum value of the ACBG in step (b) is set to be greater than the threshold value that is predetermined for the minimum value of the ACBG in step (a), and wherein the new threshold value of the difference between the maximum value and the minimum value of the pitch delay in step (d) is set to be smaller than the threshold value of the difference between the maximum value and the minimum value of the pitch delay in step (a), in order to adapt to different operating environments, as described by Gupta (col. 5, line 65 – col. 6, line 10).

5. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gao, in view of Gupta, as applied to Claim 2, above, and further in view of Sewell et al. (US 6,708,146), hereafter Sewell.

As per Claim 10, Gao, in view of Gupta, fail to teach wherein in step (a), the input frame is classified as speech if the FCBG and the minimum value of the ACBG of the input frame are greater than their respective thresholds, and the NSR and the difference between the maximum value and the minimum value of the pitch delay are smaller than their respectively thresholds.

Sewell suggests wherein in step (a), the input frame is classified as speech if the FCBG and the minimum value of the ACBG of the input frame are greater than their respective thresholds, and the NSR and the difference between the maximum value and the minimum value of the pitch delay are smaller than their respectively thresholds ("clear majority of decisions classifying a single class", col. 19, lines 7-18; where voice activity decisions based on different parameters are each classification decisions, and Sewell shows that it is known to use a majority technique in classification [e.g., speech/noise])

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Gao, in view of Gupta, to include the teaching of Sewell of wherein in step (a), the input frame is classified as speech if the FCBG and the minimum value of the ACBG of the input frame are greater than their respective thresholds, and the NSR and the difference between the maximum value and the minimum value of the pitch delay are smaller than their respectively thresholds, in order to avoid misclassification, as described by Sewell (col. 19, lines 8-18).

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. See PTO-892.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ERIC YEN whose telephone number is (571)272-4249. The examiner can normally be reached on M-F 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached on 571-272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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EY 5/30/08

/Patrick N. Edouard/
Supervisory Patent Examiner, Art Unit 2626